

CLAIMS

We claim:

1. A steering system for an articulated vehicle, comprising:
 - a) a first frame;
 - b) a second frame pivotally connected to the first frame by a pivot joint;
 - c) at least one hydraulic cylinder, connected between the first frame and the second frame and spanning the pivot joint, to articulate the first frame and the second frame relative to one another;
 - d) a proportional solenoid valve in communication with the hydraulic cylinders to control the flow of hydraulic fluid to the hydraulic cylinder;
 - e) an operator controlled steering input device;
 - f) a processor communicatively connected to the proportional solenoid valve and to the steering input device to control the valve in response to inputs from the steering input device; and
 - g) a sensitivity selector communicatively connected to the processor to provide an input signal to the processor that causes the processor to vary the signal output to the valve in accordance with the input signal from the sensitivity selector.
2. A steering system for an articulated vehicle as recited in claim 1, wherein the setting of said sensitivity selector is determined directly by an operator.
3. A steering system for an articulated vehicle as recited in claim 2, wherein the operator may set the sensitivity selector to either of at least two different settings, one of which causes the processor to produce more steering response for a given input from the steering input device than the other.
4. A steering system for an articulated vehicle as recited in claim 1, wherein the setting of the sensitivity selector is determined by what gear the vehicle is in.
5. A steering system for an articulated vehicle as recited in claim 1, wherein the setting of the sensitivity selector determines the rate at which articulation takes place in response to a given operator input to the steering input device.

6. A steering system for an articulated vehicle as recited in claim 1, wherein the setting of the sensitivity selector determines the magnitude of articulation that takes place in response to a given operator input to the steering input device.

7. A steering system for an articulated vehicle as recited in claim 1, wherein the setting of the sensitivity selector determines the rate of change of articulation and the magnitude of articulation that takes place in response to a given operator input to the steering input device.

8. A steering system for an articulated vehicle as recited in claim 1, wherein the steering input device is an electronic joystick.

9. A steering system for an articulated vehicle as recited in claim 1, wherein the steering input device is an electronic steering wheel.

10. A steering system for an articulated vehicle as recited in claim 1, further comprising a positional feedback sensor, communicatively connected to the processor, for measuring an articulation angle between the first frame and the second frame and communicating the articulation angle to the microprocessor.

11. A steering system for an articulated vehicle as recited in claim 10, wherein the processor controls the valve to articulate the first frame and the second frame into an aligned position when the steering input device is placed in a center position.

12. A steering system for an articulated vehicle as recited in claim 1, further comprising an operator input device communicatively connected to the processor for allowing an operator to input a tire size.

13. A steering system for an articulated vehicle as recited in claim 12, wherein the processor determines a maximum articulation angle between the first frame and the second frame based on the tire size input by the operator.

14. A steering system for an articulated vehicle as recited in claim 13, wherein the processor controls the valve to prevent articulation of the first frame and the second frame past the maximum articulation angle.

15. A steering system for an articulated vehicle as recited in claim 14, wherein the processor controls the valve to slow down articulation as the maximum articulation angle is approached.

16. A steering system for an articulated vehicle as recited in claim 1, wherein the processor controls the rate of displacement of the valve.

17. A steering system for an articulated vehicle as recited in claim 16, wherein the processor controls the valve so as to gradually start and stop articulation.

18. A steering system for an articulated vehicle, comprising:

- a) a first frame;
- b) a second frame pivotally connected to the first frame by a pivot joint;
- c) at least one hydraulic cylinder, connected between the first frame and the second frame and spanning the pivot joint, to articulate the first frame and the second frame relative to one another;
- d) a proportional solenoid valve in communication with the hydraulic cylinders to control the flow of hydraulic fluid to the hydraulic cylinder;
- e) an operator controlled steering input device;
- f) a processor communicatively connected to the proportional solenoid valve and to the steering input device to control the valve in response to inputs from the steering input device;
- g) wherein the processor controls the valve to align axes of the first frame and the second frame to be generally parallel when the steering input device is returned to a center position.

19. A steering system for an articulated vehicle, comprising:

- a) a first frame;
- b) a second frame pivotally connected to the first frame by a pivot joint;
- c) at least one hydraulic cylinder, connected between the first frame and the second frame and spanning the pivot joint, to articulate the first frame and the second frame relative to one another;
- d) a proportional solenoid valve in communication with the hydraulic cylinders to control the flow of hydraulic fluid to the hydraulic cylinder;

- e) an operator controlled steering input device;
- f) an input device for an operator to input tire size;
- g) a processor communicatively connected to the proportional solenoid valve and to the steering input device to control the valve in response to inputs from the steering input device;
- h) wherein the processor controls the valve so as not to exceed a maximum articulation angle between the first and second frames which the processor sets based on the tire size input by the operator.

20. A steering system for an articulated vehicle, comprising:

- a) a first frame;
- b) a second frame pivotally connected to the first frame by a pivot joint;
- c) at least one hydraulic cylinder, connected between the first frame and the second frame and spanning the pivot joint, to articulate the first frame and the second frame relative to one another;
- d) a proportional solenoid valve in communication with the hydraulic cylinders to control the flow of hydraulic fluid to the hydraulic cylinder;
- e) an operator controlled steering input device;
- f) a processor;
- g) an interface operatively connecting the steering input device to the processor;
- h) wherein the processor operates the proportional solenoid valve in response to inputs from the steering input device;
- i) wherein the interface is the same for different types of steering input devices.

21. A steering system for an articulated vehicle, comprising:

- a) a first frame;
- b) a second frame pivotally connected to the first frame by a pivot joint;
- c) at least one hydraulic cylinder, connected between the first frame and the second frame and spanning the pivot joint, to articulate the first frame and the second frame relative to one another;

- d) a proportional solenoid steering valve in communication with the hydraulic cylinders to control the flow of hydraulic fluid to the hydraulic cylinder;
- e) at least one other solenoid valve to control at least one other function;
- f) a source of pressurized hydraulic fluid which supplies hydraulic fluid under pressure to both of said valves;
- g) an operator controlled steering input device; and
- h) a processor communicatively connected to the steering valve and to the steering input device to control the steering valve in response to inputs from the steering input device, and communicatively connected to the other solenoid valve to control it;
- i) wherein the processor gives priority of flow from the source of hydraulic fluid to the steering valve.